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Rail-Road News.

Fall of a Railroad Bridge Near Frankfort, Kentucky.

The Louisville papers of the 19th inst. mention the following account of the recent accident near Frankfort, which was briefly noticed in a telegraph despatch a few days ago. On Friday afternoon, while the hands were pushing some movable shanties across the bridge over Benson, creek near Frankfort, the bridge, which was of cast-iron, gave way and the whole fell with a crash, killing instantly two men, Edmund Bacon, of Frankfort, John Franey, a laborer, and a white woman who cooked for the laborers, name not ascertained. Some eight or ten others were hurt, several badly and one had his leg crushed so that it is feared he cannot recover, who has been brought down to the hospital. Several were precipitated into the creek, who escaped with wet jackets. It had been intended to cross with the locomotive, but some delay had been occasioned, and some 20 men proceeded to move them by hand, thus preventing a much more serious disaster. The front shanty was crammed with all the tools, &c., weighing about 15,000 lbs., and broke through first, drawing the others after it. Some gross remissness must have been observed in the construction of the bridge, that it should have been insufficient to bear such a comparatively inconsiderable burthen.

The Erie Canal and Utica and Schenectady Railroad.

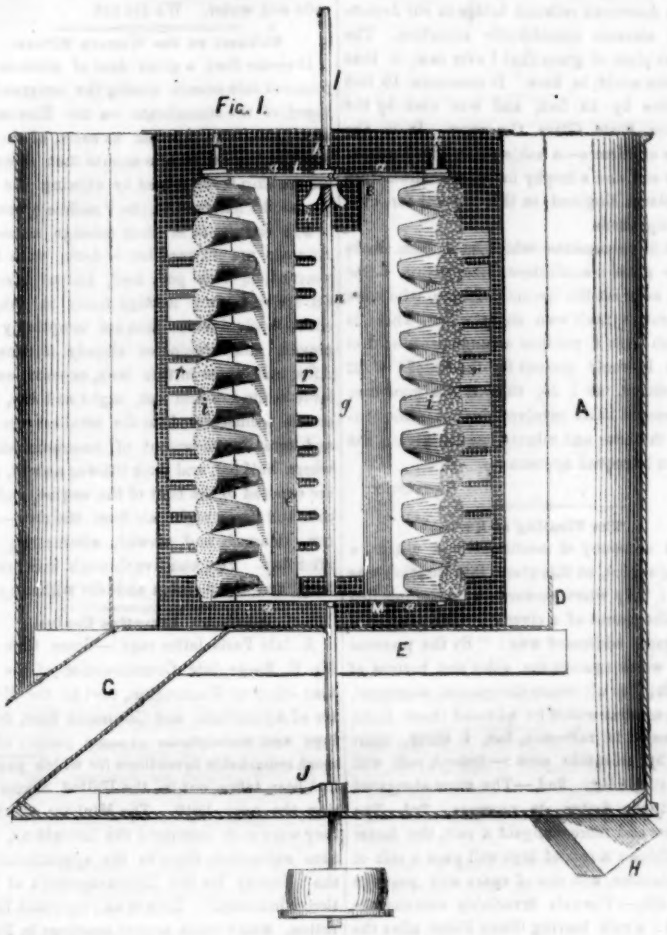
The Erie Canal went into full operation in the spring of 1826. Reductions in the rates of toll then established have since been made, equal to fifty per cent., yet the aggregate revenue has increased in 24 years 333 per cent., or an average increase of over 13 per cent. for each year. In the last fifteen years the average increase of revenue at reduced tolls, has been 18 per cent., and last year the increase over the preceeding year was 22 per cent. The Utica and Schenectady railroad, 78 miles in length, constructed in 1386, and put in operation for a million and a half dollars. The prosperity of this road has been such, that already the shareholders have received back all the principal monies paid to the company, with interest thereon at 7 per cent., and are now owners of a clear surplus in stock equal to $3,488,390 52.

It is contemplated to build another railroad on the south of the Erie Canal along the same valley.

The temperature of human blood is 99 5-10° Fahr., it is independent of the place where it lives—it is constant, and external objects act upon it by addition or subtraction of caloric, according to the greater or less heat of these bodies; this is the reason of the sensation of heat or cold, and it is from that peculiarity that man is apt to live in all climates.

IMPROVED FLOUR AND GRAIN DRESSING MACHINE.

Fig. 1.



The accompanying engravings represent new improvements in machinery for cleaning, sifting, and purifying ground grain and other substances. The inventor is Mr. Solomon W. Kirk, of Coatsville, Chester Co., Pa., who has taken measures to secure a patent for the same.

Figure 1 is a vertical section of the machine, showing its interior. Figure 2 is a horizontal section; Figure 3 is an elevation of one of the movable wings. The same letters refer to like parts on all the figures.

Fig. 3

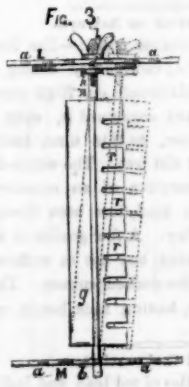
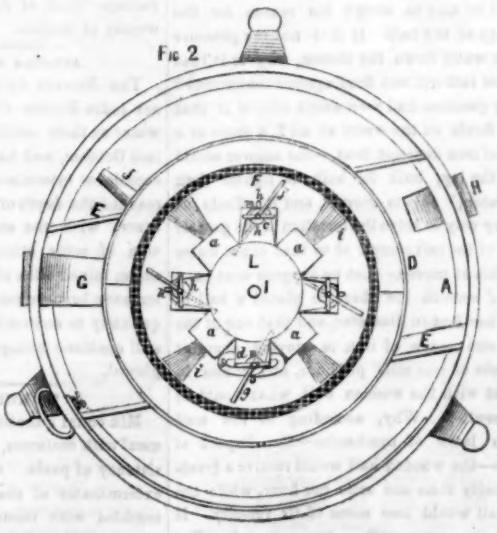


Fig 2



The nature of the invention consists in the employment of vanes or wings situated between the bars of a series of revolving brushes in the inside of a separator cylinder and screen, the said vanes being separately independent in action and capable of being set in various positions and at different angles, and so adjusted as to act in retarding or quickening the passage of the ground grain, &c., through the screen, or to change its direction, as may be desired. This machine is represented as being set upon a vertical spindle, but it can be set angularly or in a horizontal position.

A is the outer case of a flour dressing machine; D is a table carried by connecting strips, E E, for supporting at the required distance from the outer case, the wire cloth screen, F'; G, is the outlet for the bran &c. from the inside; H is the delivery flour spout, from between the outer cases; I is the spindle with an arm, J, near the bottom of the outer case for clearing the flour out of H. The shaft is driven by the band pulley below; L is the upper diss of the revolving reel; M, fig. 3 is he lower one. They are secured on the shaft, I, and have suitable arms, *a a*, *b b*, *c*, and *d*, for carrying the brushes on their bars, *e e*, and the vanes, *f g*; *i i* are the brushes. They sweep round and drive the ground grain through the wire screen. The vanes, which is the particular part of this improvement are double leafed and formed in comb fashion, *r r r*, as in fig. 3. The vanes or wings are fixed on separate axes, *m n*; *h h h h* are the thumb screws to fasten each axis when it is set in its proper position. In fig. 2, the axes of the vanes are seen placed in slots, thus showing how they can be set inclined forward as in fig. 3, and when in that position act upon the ground grain &c., to force it in a downward direction. These vanes, as shown in fig. 2, can be set each, or all, at an angle, or straight out, so as to force the grain quicker through the screen by revolving, as now shown to the right, or slower if angled to the left.

The manner of attaching the spindles, *m n*, of the vanes, may be by the projections, *c d*, according to the set of the vanes, the projection *c* serving only to admit of the spindle, *m* of the *vane*, *f*, to be turned, to fix the leaf nearer or further from the screen, and cause the double leaf to fan the meal at variable angles. The piece, *d*, attached to the upper disc is of an arc shape with a groove, *s*, in it, which allows the vane, *g*, to be turned as described, in the set of the vane, *f*, (fig. 2,) and also to act more or less out of the perpendicular by the travel of the axis, *n*, along the groove, the said axis fitting into its bottom disc to admit of this. In this way the vane regulates the direction and motion of the meal inside of the screen. Any number of vanes and brushes may be used, and all vanes may be secured like the one, *g*, or the one, *f*, as described. The meal enters by a hopper in the top and is acted upon by the blast of the vanes and the action of the brushes. The action of the vanes can be regulated, as set forth, regulating the intensity of the blast by the angle of the vanes and the direction of it by the angle of the axis (in fig. 2). By these ajustable vanes, the perfect cleansing of the flour, grain, &c. is accomplished, and at the same time, a coarser or finer flour as may be desired can be produced. These vanes for damp or very dry flour can be so adjusted as to operate equally according to the required conditions.

The claims are for vanes with blades capable of being set at angles, also for being set on adjustable spindles. It operates very successfully and is worthy of general attention.

More information may be obtained by letter addressed to Mr. Kirk.

Discovery in Surgery.

Among the scientific critics in Berlin, according to the correspondent of the Philadelphia Bulletin, there has been some interest lately in a newly claimed discovery of the application of chlorine to cure cases of pain. The difficulty in the use of chloroform, thus far—and a difficulty far more felt in Europe than America—has been the danger of suffocation, or of otherwise injuring the body by such a total stoppage of some of its functions. This new applicatian claims the merit of escaping the danger. According to this account, the fluid, (some 10 or 20 drops,) is dropped on the part affected, or on a lint bandage slightly moistened with water, and then applied, and all bound up in oil silk, and a linen band. After from two to ten minutes the part becomes insensible, and the pain is no longer felt, whether it be from rheumatic, nervous, or other disorders. After a time it returns again, but usually weaker, and with several applications it is often entirely relieved. The discoverer's name is Aran, and he has already presented a memorial on the subject to the Academy of Paris.

Miscellaneous.

[Special Correspondence of the Scientific American.]

LONDON, May 16th, 1851.

The London Illustrated News has some very fine half imaginary engravings of some works of art exhibited at the fair. One thing represented is a beautiful designed iron gate, which should attract the attention of our countrymen. I have seen some castings in iron here which surpass anything of the kind, I ever expected to see, and this gate is one of them. It is placed within the grand entrance, and forms a subsidiary bar; the scene beyond this gate is magnificent,—but let me pass on to describe something I have not yet in any of my letters described, this is the great diamond of Lahore, "the Mountain of Light." This diamond is now the property of the crown of England; it once sparkled in the coronet, it is said, of the princes of Persia. It is displayed in a machine formed for its reception by Mr. Chubbs, the celebrated lock manufacturer, of London. This machine is impregnable. The diamond is let down into its recesses at night, and raised for exhibition in the morning. Mr. Chubbs' diamond case is extremely ingenious, but nobody except the maker fully understands the mechanism. It has to defend property, valued at one million sterling, which might be slipped into one's pocket without greatly increasing its bulk. This great diamond has an interesting history. It was the property of Runjeet Singh during his life. The able Sikh leader had two estimates of its value. He knew its worth in money, but he knew also that it possessed influence which money could not buy; for the Hindoos regarded it as the symbol of power and success, and it is worth "ten thousand men" to an ambitious prince. The political importance of "the Mountain of Light" induced its removal to England; but it is the greatest of the world's gems—the premier diamond that earth has yielded yet.

Among the statuary there is a splendid work of art by a German artist from Berlin. It is a most noble group, and it is rumored that some of our countrymen have become the purchasers. It is called the "Amazonian Group," and is an embodyment in statuary of a familiar painting. The Queen of the Amazons is mounted on a splendid charger. A lion has sprung at the lady on the horse, fixed his huge claws in the horse's neck, and hangs suspended by them between the horse's fore legs. The Amazon poises her spear and is in the attitude of striking. Her expression is most admirable, and nobody can doubt that the next act of the tragedy will bury that javelin deep in the lion's neck, for the lady has a muscular arm, and will be felt when she strikes.

To the finest conception of limbs and arms, and bust and figure, there is added such a face of exquisite beauty in cool, determined revenge, as I never saw.

This is allowed to be the finest group in the building, and if true that it is destined for America, it will command universal admiration. There is a group of Milton and his two daughters, a glorious composition, and then a short distance from them stands one of the noble if not the most noble of English Reformers, John Hampden,—Milton and Hampden, what names! how the heart thrills as they are mentioned. Statuary is grouped in all directions. A lion of immense bulk, said to be one of four intended to form a group at one of the gates of Munich, occupies a large space, and resembles a large mansion in size. This casting is shown chiefly for its magnitude, and in that respect is admirable, and probably unrivalled.

A colossal equestrian statue of Godfrey de Bouillon, from Brussels, follows the last-mentioned group, and is remarked at once from its magnitude. "Achilles Wounded" forms a splendid production. The Grecian hero, who believed himself to be invulnerable, is represented as bending, and turning to seize the arrow which has penetrated into his heel, and seems to quiver yet in the wound. The figure in that posture was necessarily a bold and difficult undertaking for the sculptor. The face of Achilles is peculiarly handsome, although he is evidently suffering considerable pain; but the artist's powers were necessarily taxed, by the nature of the tale, to mingle pain and astonishment, disappointment and incredulity, in the same features. Achilles was dipped by his mother in Styx, to render him invulnerable, but she grasped him by one heel in the operation, and then omitted to bathe it.

But here I must stop, for the works of art would make up a respectable catalogue, by the mere enumeration of their names.

An American railroad bridge in our department attracts considerable attention. The largest plate of glass that I ever saw, or that is in the world, is here. It measures 18 feet 8 inches by 10 feet, and was cast by the Thames Plate Glass Company. It is the prince of mirrors—a noble plate, worth a journey to see, and a trophy in glass manufacture that places England in this respect far over all competitors.

The improvements which have been made in the glass manufacture here, within a few years, astonish the German visitors, who were confident in their own superiority. There is a watch with a peculiar arrangement of dial which I would present for the benefit of all who believe, as I do, that it is a good one. The second hand revolves in the same centre as the hour and minute hands, giving the dial an improved appearance.

EXCELSIOR.

The Floating of Rafts.

In a company of mechanics and others, a few days since, at this place, this question was raised: "By what power is a raft propelled down the course of a river?" The answer of the person addressed was: "By the pressure of the water against the sides and bottom of the raft;" to all which the querist demurred, and to combat which he adduced these facts, well known to raftsmen, but, I think, overlooked by scientific men:—1st—A raft will pass a single log. 2nd,—The more elongated the raft the faster its progress. 3rd—The smoother and more compact a raft, the faster its motions: a raft of logs will pass a raft of sawed lumber, and one of spars will pass the logs. 4th,—The raft invariably outruns the current: a raft leaving Olean Point after the water has passed its maximum height, and is falling, is obliged to lie up at Pittsburgh to wait for water; and the distance between Pittsburg and Cincinnati is passed in five days by a raft, while the water requires eight days.

Yours, A. R.

Silver Creek, Chataque Co., N. Y.

[The objections of the demurrer, mentioned above, are proof positive for—not against—one answer given respecting the *power* (pressure) which propels a log or raft down a stream. A person not satisfied with such an answer, should be able to assign his reason for the floatage of the raft. If it is not the pressure of the water down the stream, why is it that a log or raft will not float against the current? If the question had been asked why is it that a log floats on the water at all? a stone or a piece of iron does not float,—the answer would be, "the log, bulk for bulk, is lighter than the water;" this is correct, and it affords us an easy way to solve the question of the greater speed of the raft compared to that of the water in which it moves. Let us suppose that on a field of smooth ice there is placed a ball of wood one foot in diameter, and that one of the same size made of iron is moving along at the rate of one mile per hour, and comes in contact with the wooden ball, what would be the result? Why, according to the well known laws of mechanics—the impact of bodies—the wooden ball would receive a greater velocity than one mile per hour, while the iron ball would lose some of *its* velocity. It is just the same with a log or a raft. The wooden ball will move the faster and attain to the greater distance according to the smoothness of the ice—the absence of resistance—and so will the log or raft. The resistance which the log and raft has to overcome, is the water to be displaced before them, consequently a raft has less resistance than a log, and will therefore move faster. The friction on the sides of the log, mentioned in the answer above, as assisting to move it, is an error, the friction retards the log—this is the reason why a smooth log will move faster than a rough one, and thus the whole answer to objection third is made evident. There surely cannot be a doubt about the reasons why a raft moves faster than a log, the log faster than a sawed bad shaped timber, and a spar than a log. Could a square piece of wood move as fast through the air as an arrow, allowing both to be the same weight? No. But, friend, are you quite satisfied about the speed of the rafts and water. We are not

Sickness on the Western Rivers.

It seems that a great deal of sickness has occurred this season among the emigrants on board of the steamboats on the Mississippi, and have been reported as cases of cholera. The Cincinnati Gazette asserts that these cases are ship fever caused by stowing the emigrants like Africans on the "middle passage."

The emigrants in their passage across the Atlantic are crowned below deck, with little ventilation, with poor food, and no exercise. On arriving they indulge freely in fish, the cheap tropical fruits that are temptingly displayed, and vegetables already in decay.—After indulgence in this way, exposed on the levee in the sun and wet, night and day, they crowd themselves into the smallest compass and most inconvenient of accommodations, where, half fed, and with little or no rest, they are exposed to the heat of the engine, and the cold and damp night air from the river—frozen, steamed, and stewed, alternately, day after day. Few can live through this process long, and many sicken and die without care.

American Inventive Genius.

A late Paris letter says:—Some time ago Mr. E. Burke, late Commissioner of the Patent Office at Washington, sent to the Minister of Agriculture and Commerce here, drawings and descriptions of some twenty of the most remarkable inventions for which patents had been taken out in the United States during the year 1840. The Minister to whom they were sent examined the inventions, and then submitted them to the appreciation of the "Society for the Encouragement of National Industry." This is an important Institution, which holds annual meetings in Paris, presided over by M. Dumas, the distinguished chemist, the late Minister of Agriculture and Commerce, and having, as Secretary, Charles Dupin. The Society referred the American inventions to a committee, with instructions to make a report and signalize such as might appear to be worthy of special action of the society in relation to them. At a recent meeting the report was made, and it seems that the committee have been so favorably impressed with the efforts of American ingenuity submitted to it, that certainly two, and perhaps three or four, have been pronounced worthy of medals.

Artesian Well at Newark.

The Newark Advertiser says:—The Newark India Rubber Co., commenced boring for water at their establishment on High street, last October, and have continued it, with an occasional intermission, to this time, having reached the depth of 420 feet. The whole distance, with the exception of an occasional vein of some other kind, has been through shale, mixed with clay. A few gushes of water have been presented, but not in sufficient quantity to answer the desired purpose. They still continue boring, having nine hands employed.

To Kill Cockroaches.

Mix equal quantities of red lead and Indian meal with molasses, making it about the consistency of paste. It is known to be a certain exterminator of roaches. A friend who was troubled with thousands upon thousands of them, rid his house of them in a very few nights by this mixture. Put it upon plates and set it where the vermin are thickest, and they will soon help themselves. Be careful not to have any article of food near by where you set the mixture.

[The above is from an exchange. We have not tried it, but from the nature of the substances employed, think it is a good receipt.

Soft Soap.

The principal difference between soaps with base of soda, and soaps with base of potash, depends upon their mode of combination with water. The former absorb a large quantity of it, and become solid; they are chemical hydrates. The others experience a much feebler cohesive attraction; but they retain much more water in a state of mere mixture. From its solubility, more alkaline reaction, and lower price, potash soap is preferred for many purposes, and especially for scouring woolen yarns and stuffs.

Soft soaps are usually made in England with whale, seal, olive, and linseed oils and a certain quantity of tallow; on the continent, with the oils of hempseed, sesame, rape-seed, linseed, poppy-seed, and calza; or with mixtures of several of these oils. The potash lyes should be made perfectly caustic, and of at least two different strengths; the weakest being of specific gravity 1·05; and the strongest, 1·20, or even 1·25. A portion of the oil being poured into the pan, and heated to nearly the boiling point of water, a certain quantity of the weaker lye is introduced; the fire being kept up so as to bring the mixture to a boiling state. Then some more oil and lye are added alternately, till the whole quantity of oil destined for the pan is introduced. The ebulition is kept up in the gentlest manner possible, and some stronger lye is occasionally added, till the workmen judges the saponification to be perfect. The boiling becomes progressively less tumultuous, the frothy mass subsides, the paste grows transparent, and gradually thickens. The operation is considered to be finished when the paste ceases to effect the tongue with an acrid pungency, when all milkiness and opacity disappear, and when a little of the soap placed to cool upon a glass-plate assumes the proper consistency.

Soft Toilet Soap.

Its manufacture being conducted on the principles already laid down presents no difficulty to a man of ordinary skill and experience; the only point to be strictly attended to is the degree of evaporation, so as to obtain soap always of uniform consistence. The fat generally preferred is good hog's lard; of which 30 pounds are to be mixed with 45 pounds of a caustic lye; the temperature is to be gradually raised to ebulition, but the boil must not be kept up too long, or too briskly till after the saponification is completed, and the whole of the lye intimately combined with the fatty particles; after this, the evaporation of the water may be pushed pretty quickly, by a steady boil, till copious vapors cease to rise. This criterion is observed when the paste has become too stiff to be stirred freely. The soap should have a dazzling snowy whiteness, provided the lard has been well refined, by being previously triturated in a mortar, melted by steam heat, and then strained. The lard soap so prepared is semi-solid, and preserves always the same appearance. If the paste is not sufficiently boiled, however, it will show the circumstance very soon; for in a few days the soap will become gluey and stringy, like a tenacious mass of bird lime. This defect may not only be easily avoided, but easily remedied, by subjecting the paste to an adequate evaporation. Such soaps are in great request for shaving, and are most convenient in use, especially for travellers. Hence their sale has become very considerable.

Valuable Paste for Books.

Horse-chestnuts ground and made into liquid paste is very good for book-binders, instead of flour paste, because it contains a bitter substance which keep away the insects that prey upon books and destroy them. All this bitter substance can be separated by the following method. The brown shell is first taken out, and the inside is rasped to powder, to which is added some carbonate of soda in the proportion of 1 to 100; it is then placed in a seive and put under a slight running stream of water, which washes out all the bitter substance, and receives a blue color; the starch falls to the bottom, and after being washed again in clean water, becomes as sweet as that made of flour or potatoes. The same process could be tried with acorns.

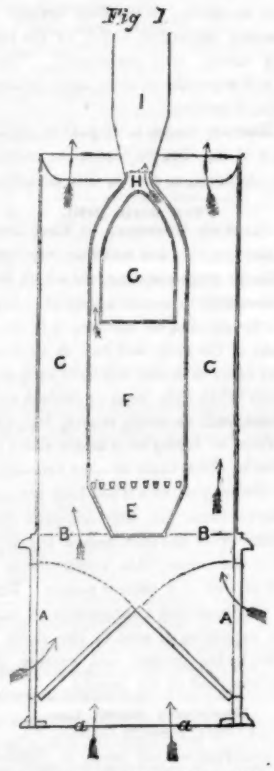
Ruttan's Patent System of Ventilation.

No clearer proof that the ventilation of buildings has not hitherto been reduced to a science need be adduced, than to state that no two persons have agreed as to what particular mode is *best*, or indeed that there is a certain way in which it should be rigidly carried out. Letting air into a house at some place or places, and out at another, appears to be all that has been attempted both with respect to mechanical and spontaneous ventilation. The latter mode is the one we now intend to make a few remarks upon, for this reason, the mechanical mode is impracticable for usual application on account of its expensiveness.

That there is some system by which air can be made to circulate as freely through our dwellings as outside of them, and that this will shortly be if it has not already been discovered, no one in this age of improvement, we presume, will doubt—its necessity, at least, is no longer a matter for controversy. The only thing now sought for is a philosophical principle by which it can be accomplished.

These few remarks are made to introduce the accompanying engravings which illustrate the patent granted to John Ruttan, Esq., Coburg, Canada West, the claim for which was published in our list of last week, and noticed

Fig 1



by us at the time, and as this subject is attracting a great deal of attention at the present moment, a great many of our readers will no doubt be interested in all we say upon the subject; and first of all we will now present the references to the engravings, so that what we say afterwards about the improved system of Mr. Ruttan, may be made more clear, and therefore more easily comprehended.

Fig. 1 is a vertical cross section. Fig. 2 is a perspective view. Fig. 3 is a vertical longitudinal section. Fig. 4 is a horizontal section. Fig. 5 is a wooden or iron pedestal. Fig. 6 is a bottom plate. Figures 7 and 8 show the manner in which the ventilating air is drawn under the floors.

A A are apertures to admit air from rooms. *a a* are apertures to admit air from outside. B B are apertures in the bottom plate. C C are apertures on each side of the stove. D are apertures to admit cold air from outside for oven. E is an ash pit. F is a fire chamber. G is an oven. H is a fire flue round the oven. I is a smoke pipe. K is the skirting or base. L are foul air apertures in skirting. M the floor of room. N are joists. O a space between joists. P are two inch slats, or firring nailed across joists, to lath to. Q lath and plastering. R a space between plastering and bottom of joists, for circulation of air across the joists.

This machine is not necessarily connected with ventilation: any process by which the ventilating air may be warmed, not heated, will be just as effectual, but Mr. Ruttan has invented this stove for supplying a deficiency—the hot-air machines in use being too cumbrous and expensive for small dwellings, school houses, and offices, even if the air proceeding from their hot-air chambers was not injured by heat. Mr. Ruttan's principle, with regard to the ventilating air, appears to be quantity of air, not heat. He barely warms the air and makes up by quantity of air what has hitherto been accomplished by quantity of heat; and in order to cause this extra quantity of air to flow through the house (for this, ventilation of dwellings is beyond dispute.

Fig 2

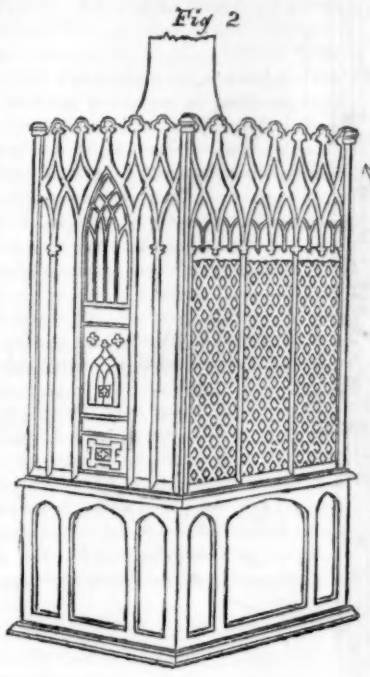
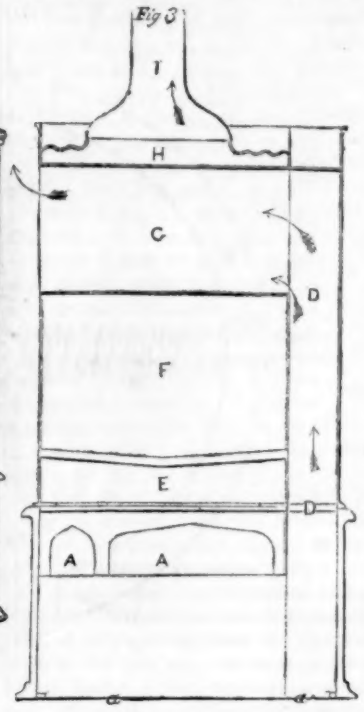


Fig 3



Mr. Ruttan's is the downward principle of ventilation, and he says the building may be filled with warmed air, which, after it has done its work in warming and carrying off the miasm, all settles and falls down into the basement, and is thence carried out through the chimnies or "foul air shafts," as he calls them. The *modus operandi* of constructing the first floor of the house, will be comprehended by a view of figs. 7 and 8, where it will be observed the foul air is drawn under the floor, to the boards of which it imparts the residue of the warmth, and then passes out between the joists and the ceiling of the cellar or basement, into and up the flues.

Now, if it be a fact, what Mr. Ruttan asserts, that air will flow through a building so constructed, as to take in the atmosphere at a lower point than that at which it is taken out, under all circumstances and with a rapidity in a ratio equal to the difference between these two points, then we think he has accomplished what he professes to have done, and the importance of this principle to the

Fig 4

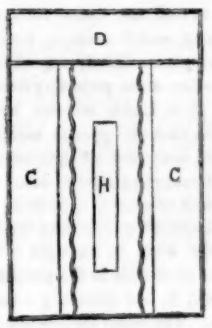


Fig 5

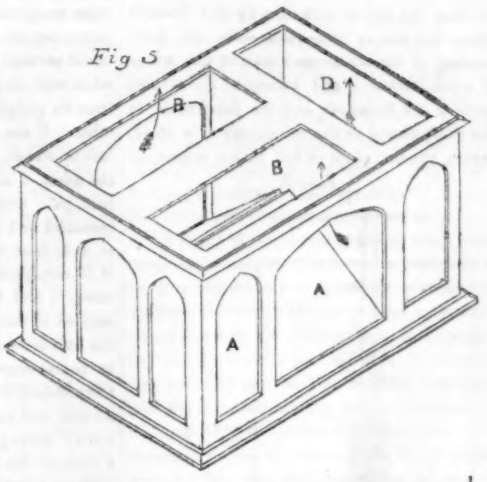


Fig 6

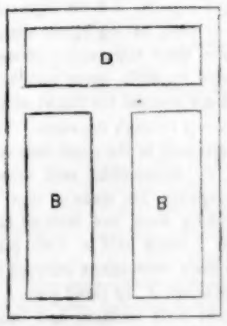
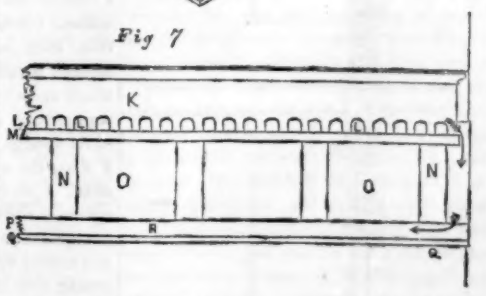


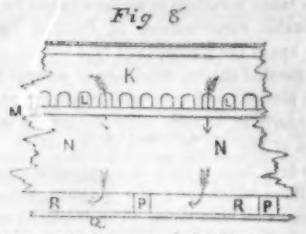
Fig 7



we do think there ought to be sufficient enterprize and public spirit in some of our architects to give the system a trial; if found to work, our architects could, with confidence, assure proprietors of new houses that their dwellings would be thoroughly ventilated and warmed when completed, and save them the trouble, vexation, and annoyance of a second operation to make them habitable; they might depend upon an ample reward in the business it would bring them. Mr. Ruttan has given this subject long and serious attention, and by study and experiment upon experiment, the result is here presented to our readers. It is now the subject of a patent for the United States—having cost the inventor $500 for the simple fee, showing no small amount of confidence in its merits.

This ventilating stove is intended to be put in the hall of any house already built, for the purpose of supplying it with ventilating and warmed air, but it will be most effectual the greater the number of fire places that are contained in the smallest house. Where there is flue room to the extent of four feet it will throw 500 cubic feet of air per minute through

Fig 8



the house, which is enough for 50 persons, allowing 10 cubic feet to each.

More information may be obtained by letter addressed to Mr. Ruttan (post-paid), who is Sheriff of Coburg, C. W.

A New Physiological Test for Insanity.

A correspondent of the Philadelphia Ledger says:—

"Peter A. Browne, Esq., in his examination as a witness, in the recent trial of Warder Cresson, before Judge King, on a traverse of a commission of lunacy, testified that his opinion of Mr. Cresson's sanity, formed from repeated conversations with him on almost every subject, was confirmed by a microscopical examination of the roots of the hair of his head. That from a careful and extended examination of the roots of the hair of the head, for some three years, he was able to point out a remarkable peculiarity which was always manifest in the hair of the head of an insane person. On pulling out (said Mr. Browne) a hair by the root from the head—the button at the end, or root as it is generally termed, will be observed, under the microscope, to be white in color, transparent, often translucent, and in shape regular and pestle formed. In the insane, these characteristics are in all respects different; the button is dark in color, neither transparent nor translucent, and distorted, bent, and irregular in shape and form. This change in the roots of the hair Mr. Browne accounted for thus: that it is produced by bodily disease, which has this effect on the hair; that insanity of every kind is a bodily disease, and that this change in the hair is caused more generally by insanity than by any other disease; that a person may not be insane whose hair presented these peculiarities, but suffering probably from some bodily ailment; yet if the hair manifested no change, but presented the white, transparent, and pestle-shaped appearance of the button, the person was free not only from insanity but from all other diseases having this effect. Such was the appearance of Mr. Cresson's hair under the microscope, and Mr. Browne declared on oath that this test was confirmatory of his opinion in favor of his sanity.

Mr. Browne exhibited to the jury many hundred specimens of hair collected from five lunatic hospitals, and testified that every specimen had this characteristic of insanity. He further testified that, from the investigations he had made, he had no doubt whatever of the theory he advanced, that it was based on actual experiment, and confirmed by every observation he made."

[Such a theory should be received with great caution. We will not say, "it is incorrect" because there may be some truth in it, but it would take some personal examination of cases to convince us of its positive force, as the basis of a science. There are so many different kinds of lunacy, that it appears impossible that all should develope one peculiar appearance and form of the capillary roots. Many new theories have been advanced by scientific and able men, but which have turned out to be founded on the ideal only.

Yellow Amber.

In a recent overflowing of the Instar, in the province of Gumbrunen, Prussia, a piece of yellow amber weighing 8 1-5th lbs., measuring 11 inches in length, 9 in width, and 6½ in thickness, was found. With the exception of a piece of 13 lbs. in the Museum of Natural History of Berlin, it is the largest piece of yellow amber ever discovered.

New Inventions.

Improved Printing Press.

Mr. Thomas H. Dodge, of Nashua, N. H., has taken measures to secure a patent for some valuable improvements in Printing Presses. He hangs the plattens and type beds on cranks of parallel shafts, which are so arranged that the plattens and type beds are always parallel or nearly so, to each other during the revolution of the shafts. The shafts which carry the type beds, revolve in an opposite direction to those which carry the plattens, but act in connection with them. The cranks on one set of shafts are so arranged in relation to those of the other, and act with them in such a way that each platten moves in the same direction longitudinally corresponding with the type bed. Both move to and from one another, but are brought sufficiently close at the right moment to make the impression by the type on the sheet of paper. It is intended that the sheet upon which impressions are to be made shall be a continuous web, fed in and cut off by an operating knife into proper lengths. The impressions are made on a flat square surface, but the motion of the plattens and type bed are eccentric, so as to make the two move free out of contact, except at the point when and where the impression is to be made. We will publish an engraving of this invention in a few weeks.

Flexible Ivory.

M. Charriere, a manufacturer of surgical instruments in Paris, has for some time been in the habit of rendering flexible the ivory which he uses in making tubes and other instruments. After giving the ivory the desired form and polish, he steeps them in hydro-chloric acid diluted with water, when they become flexible, elastic, and of a slight yellow color. In the course of drying the ivory becomes hard and inflexible, but its flexibility can at once be restored by wetting it with a wet sponge, some pieces of ivory have been kept in a flexible state, in the acidulated water, for a week without being either too much softened or injured in the texture.

Improved Power Loom Picker.

We have been shown a picker for power looms, invented by Mr. T. H. Dodge, of Nashua, above, which we believe is a very good improvement, and we know not a little about such things. The face of the picker, which receives the shod of the shuttle, is made concave, and this, we believe, is a new and useful, although simple improvement. It has been used in the Nashua Manufacturing Co.'s weaving rooms, and has received the commendation of all the overseers. It is now manufactured by Mr. Wm. Golding, of Lowell, Mass.

Improved Railroad Truck.

Mr. Danl. W. Eames, of West Turin, Lewis Co., N. Y., has applied for a patent for certain improvements in Railroad Trucks, which embrace some singular features. He employs any number of duplicate wheels so positioned at angles to the horizon, as to embrace, as it were, the rails, running rather on the sides of the edges of the rails than upon the surface or top. The invention has the object in view of preventing the carriages being thrown off the track by obstructions; also, to enable the carriages to turn more easily in abrupt curves.

Improvement in Cutting Screws.

Mr. George W. Lull, of Geneva, N. Y., has taken measures to secure a patent for some new and useful improvements in machinery for cutting screws. The improvement consists in some mechanical arrangements attached to and in connection with the "die chuck," by which the dies may be closed or contracted upon the screw or rod on which the screw is to be cut, during the time the chuck is revolving, by which a deeper cut can be taken without stopping the machine.

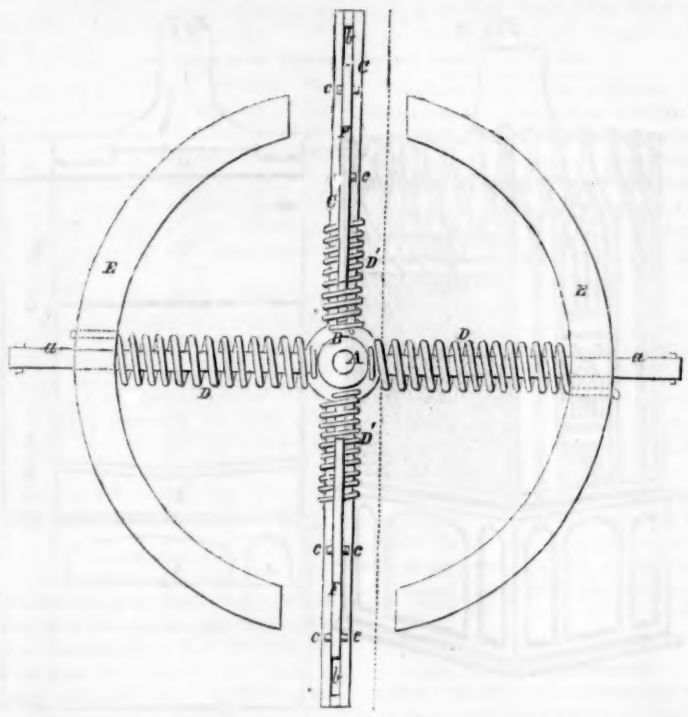
Water Proof Cloth.

We have seen some samples of cloth, such as soft kersymere, &c., made water proof by Messrs. Gordon & Brown, No. 23 Market street, Philadelphia. When water was poured on the sample which we saw, it rolled along its surface as upon a cabbage leaf or canvas-back duck. The cloth has no change in appearance, is perfectly free to the circulation of air, and is only impermeable to water.

Joiners' Improved Plow.

Mr. Jonathan W. Ward, of Milwaukie, Wisconsin, has taken measures to secure a patent for an improvement in plows for joiners, which has been highly spoken of. The gauge of the plow is operated by means of racks and pinions, the racks being attached to the under side of the guides of the gauge—a rack to each gauge—and the pinions gearing into the racks, they being secured on a rod which passes longitudinally through the stock of the plow; and by turning a button on the end of said rod, the gauges are operated very quickly and correctly according to the requirements of the operator.

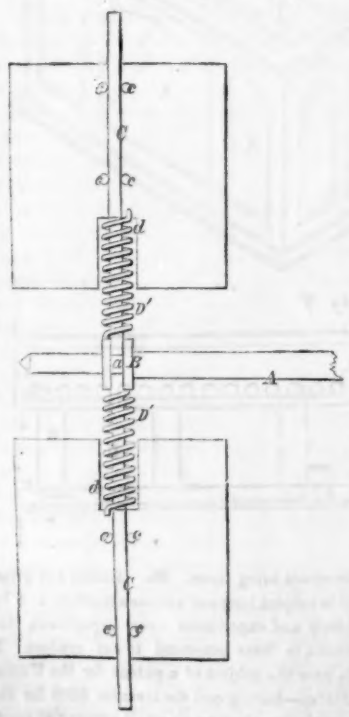
MASCHER'S PATENT REGULATOR.---Fig. 1.



The accompanying engravings represent an improvement in fan and fly-wheels for regulating machinery, and for which a patent was issued on the 6th of November, 1849, to the inventor, J. F. Mascher, Philadelphia. Figure 1 is a front elevation of a fan and fly-wheel combined on one shaft. Figure 2 is a vertical section. The same letters of reference indicate like parts.

The nature of this improvement consists in dividing the rim or curb of a fly and balance wheel into two or more parts—the one independent of the other—and making the wings of a fan movable, and attaching the divided parts of the fly-wheel and the fan-wheels to the shaft geared to the machinery of a clock, watch, musical clock or box, steam engine, or other machinery, the motion of which is to be regulated by means of spiral or other springs, in such a manner as to admit of the divided parts of the wheel, and the wings of the fan, receding from the centre of the shaft by centrifugal force, a sufficient distance to regulate the motion to the required speed—the former by inertia, the latter by the increased resistance of the air of their surfaces in their passage through the same.

Fig. 2.



A is a shaft or arbor, turning in either a horizontal or upright position, in suitable boxes, and geared to clock or watch work, the machinery of a musical box, steam engine, or other machinery where it is desirable to employ a regular motion. B is a hub or small wheel secured to near the end of the shaft or arbor and having radial arms, *a*, projecting from its periphery immediately opposite each other. C are other arms projecting from the hub or wheel, B, in pairs, midway between the arms, *a*, and likewise opposite each other, each pair being connected at their outer extremities and arranged parallel to each other, so as to form slots or spaces, *b*, between each. D D' are spiral springs surrounding the radial arms, *a*, and the arms, C, arranged in pairs, secured at their inner ends to the periphery of the hub or wheel, B, and extending outwardly in radial lines. The spiral springs marked D surrounding the arms, *a*, are longer, of larger diameter, and stronger tension than those on the arms C arranged in pairs. E E are segments of a circular rim or curb, having square openings midway between their extremities extending from their inner to their outer peripheries, through which are inserted the radial arms, *a*, which move loosely through the same. These segments are attached to the outer ends of the spiral springs, D, surrounding said arms, *a*. F F are the wings of a fan made of thin material, of an oblong form, and inserted in the spaces or slots, *b*, being held in their places, and guided in their movements outward from and toward the shaft, A, by small pins, *c*, projecting from both their surfaces, and bearing against the sides of the parallel arms, C. The inner ends of these wings have slots or spaces, *d*, formed in them, midway between their sides in which the spiral springs, D', surrounding the parallel arms, C, fit, so as to admit of the outer ends of said springs being attached to the wings, at the outer end of the slots or spaces, *d*.

The machinery of a clock or other object, to which the above described self-regulating fan and fly-wheel is geared, being in motion, the segments, E, of a rim or circular curb, and the fan wings, F, will be thrown outward from the shaft, A, by the centrifugal force exerted on them (the spiral springs, D D', to which they are attached, yielding or expanding to allow such a result), to a distance proportionate with the regular motion of the machinery moving, and the inertia and resistance exerted by the segments and wings; should the motion of the machinery, however, decrease below the regular speed, said segments and wings will be drawn toward the shaft, A, by the centripetal force exerted by the spiral springs, D D', operating against the centrifugal force exerted by the motion, and a corresponding decrease of resistance will be offered to the movement of the segments and wings, when the motion of the machinery will be instantaneously brought to its proper and regular speed. In case the motion of the machinery should go beyond the regular speed, the segments and wings will be thrown outward from the shaft, by the increased centrifugal force, and a corresponding increase of resistance will be offered them in their motions, which will immediately bring the machinery to its regular motion. By employing this method of regulating motion on musical boxes, watches, and spring clocks, their movements at the time when they are first wound up, when their springs exert the greatest expansive force, to the time of running down, will correspond. The fan wings and segments of rims may be used separately, if desired.

Mr. Mascher wishes to dispose of rights, for any part of the United States on reasonable terms. Address, as above, Philadelphia, Pa.

New Grain Drill.

Mr. Christian Hostetter, of East Donegal, Lancaster Co., Pa., has made an improvement on Drills for grain planting, for which he has taken measures to secure a patent. He employs a spring, and so attaches it to the teeth or shares of the drill, and has it so arranged that the teeth or shares will have such an elastic action when they come in contact with obstructions, such as roots, stones, &c., as will allow them to spring back and prevent breakage, also to allow them to come self-acting into their proper positions when they are past the said obstructions. It often happens that obstructions meet the drill before the driver is aware of the same; this improvement is to remove an evil of a serious nature. There is also a very excellent arrangement on this drill for the supplying of seed to the drills when they are in the ground, and cutting off the supply when out of the ground.

Woodworth Patent Case.

Circuit Court, Western District, Pa.; Judge Grier presiding.—Last week, in Pittsburg, a very important case for infringement was tried and decided by a jury. The complainant was Elisha Bloomer, the defendants were McQuewan and Douglas, also Wm. Dilworth, also Mason, Ross, and Bunting, James Millingar, A. & J. D. Kelley, R. & J. Hill, and G. Draper.

The verdict was for the plaintiff. This is all we can say about it just now. Next week we shall present the leading features of the whole case, it is one of great importance, considering the evidence adduced, to all interested in Planing Machines.

Anthracite Coal Ashes.

Prof. Norton of Yale College, says that by careful analysis there are in every 100 lbs. of anthracite coal ashes from 4 to 8 lbs. of valuable inorganic material, of a nature suitable for adding to any soil requiring manures. This is the perfectly pure ash; as we ordinarily find it, there is mixed a greater or less proportion of ash from the wood charcoal used in kindling the fires. There is without doubt enough of this, in all ordinary cases, to add considerably to the richness of the ashes. But even if we take them in their pure state, as represented by the above analyses, we can see that they are well worth collecting, and that when applied in considerable quantity they may be expected to produce a decided effect.

These ashes can be applied with advantage as a top-dressing on grass land, or as mixed in a compost; they would also be of service when thrown into tanks and hollows, to absorb liquid manures.

Scientific American

NEW YORK, JUNE 7, 1851.

False Lights.

Great as the fame of this age is for new and useful discoveries, it is not a little distinguished for the propagation of many chimerical ideas, and the trumpeting up as new, useful, and wonderful discoveries, many things which prove to be as opposite to their assumed character as darkness is to light. Two years ago our whole country was excited with the expectation of seeing a balloon start some fine morning from New York City with a cargo of miners for the gold regions of the Rio Sacramento. Pamphlets were printed, lectures were delivered, and models were exhibited to demonstrate the practicability of journeying to California in four days; and so infatuated were numbers with the plausibility of the scheme, that there was a perfect rush for passage tickets when the books were opened. It was dangerous to doubt in those days, without being prepared to be called a blockhead, a learned egotist, or some such name. It is a common practice with the projectors of all such schemes, in order to render them popular, to herald their discoveries with attacks upon philosophy. They soon place themselves on the top of their own Parnassus by extinguishing all the former lights of science, and demolishing all its strong embattlements, and after having banished it out of the world, they stand forth as "the greatest, mightiest of mankind." The balloon project has "come and gone," but for all this, we have no doubt that the same thing will be revived again not many years hence. These things, like the fashions, revolve in cycles.

Three years ago there was nothing heard of in England but "Staite's Electric Light." It was patented, published, and puffed from one end of the world, we may say, to the other. It was to send all the gas companies into Egyptian darkness in short order, and so potent was the sympathetic influence of the excitement, (for the shrewdest and wisest are subject to such influences), that the stocks of gas companies were, for a period, at a very low discount. Well, we have seen the end of this project: a few weeks ago this Electric Light became insolvent, it was executed by a number of indignant creditors, and its body consigned to that place where it had threatened to send all its old but sturdy opponents.

Three years ago a great light was discovered in our own country; it was produced from water, and it was alleged that the amount of common gas light which would cost $58,400 for 4,000 bat's-wing burners in one year, could be produced for two dollars. We stoutly asserted the impossibility of producing such a result, but we were informed that the secret would be kept for one year for rival claimants to file their bills, after which it would be given to the public, to astonish all the dwellers in Salem. Three years have nearly passed away since then, and, like Staite's Light, it has made some noise in the world, and has received the impress of Queen Victoria's Royal Turnip Seal: it has been presented to the world; we have illustrated it in our columns, —and have not cavalierly, as has been untruly asserted, but candidly expressed the opinion, that it was of no economical value whatever; and we do hereby asert that, for all *practical beneficial* purposes, it is extinguished now and forever.

The people of all nations are subject, at times, to what may be termed "sympathetic mania," and as artificial light is a subject of such vast importance to all, it is no wonder that new and wonderful lights have been discovered everywhere since the key-note was struck by the leader of this opera.

Whenever a new *savant* gets up a new light, although he deems it politic to annihilate all pre-existing science, he as shrewdly deems it prudent to array *his discovery* in the flowing garb of "academic lore." Thus it was asserted that hydrogen gas, which burns with but a faint flame, would, by passing it through turpentine, change its nature, and come out a bright white light, without any extra expense —without any change in the character or quantity of the turpentine. This was called "catalyzing the gas." Catalysis is a phenomenon in chemical science, and is termed the "Action of Presence." There is more than one opinion respecting its nature: all that we know about it is the power possessed by some bodies of resolving compounds into new forms without undergoing any change themselves: thus powdered platinum becomes red hot when moistened with the *compound* alcohol,—the spirit is fired and is converted into vinegar, without any change being produced in the metal. All catalytic changes are demonstrated by analysis—there must be a constitutional change of the elements, induced by the chemical affinity (for that it must be) produced by the silent unchanged or catalyzing body. In no instance can one body, without undergoing a change itself, produce a change in a *simple* body—such as hydrogen gas—the thing is preposterous.

The passing of hydrogen through a volatile hydro-carbon like naptha, although pretended to be new, is quite old. The passage of gases through hydro-carbon fluids, to render them more luminous, is an old story. The process renders the gas more luminous, but not by catalyzing it, and there is always an attendant extra expense. A patent was taken out in London, on the 24th of May, 1845, by John Constable for rendering water gas luminous, by passing it through turpentine,—he never thought about calling the process catalyzing—but he claimed the process for "lighting and heating,"—the same claim now set up for the new light. This process, like Staite's, we suppose, is in the hands of the Constable.

There is nothing more common than to seize on the curiosities of science, to make what is commonly but tritely termed "a handle of;" but certainly it is an ambiguous position to sit perched among the clouds and ambiguities of science.

As it respects the production of artificial light, chemistry teaches us that it requires the incandescence of solid bodies to produce a good light. The best artificial lights are produced by the hydro-carbons; but the presence of carbon is not essential to all such lights. The Drummond Light—that artificial sun—is produced by burning a jet of oxygen and hydrogen on a piece of lime (calcium), but it is too expensive and troublesome to be used for common purposes. The most common gas light is indebted to the ignition of solid particles for it luminosity; these particles are coal, and can easily be detected by observation.

We have prolonged our remarks about false lights, as a matter of duty at the present time, to put our readers on their guard against them. It has been our fortune to dabble in practical chemistry since we could crawl, and we say that it has long been known to chemists, that hydrogen gas could be rendered luminous by passing it through naptha; we have documentary evidence of the fact being ten years old at least.

Another false light, we see, has been set before the public—we allude to the rendering of the atmosphere luminous by a legerdemain process. It has been known to us for twelve years that, by blowing common air through naptha, a very beautiful flame could be obtained. It has been pretended that the oxygen of the atmosphere can be made to burn in oxygen; this is like making coal gas burn in coal gas—a thing as impossible as the construction of a perpetual motion. The way to test the merits of such lights is to publish and explain them; they are very fine while they are kept secret, but soon after they are explained and spread before the public they slink away into outer darkness, but not always, and we regret to say it, without leaving evidences behind them of having proven, to many, like false and alluring beacons, placed upon the dangerous coast of some tempestuous ocean.

Splendid Engravings of a New Patent.

Next week we shall publish the specification of the patent granted two weeks ago to Mr. St. John, of this city, for measuring the ship's way at sea. It will be splendidly illustrated with a number of fine engravings.

Prevention of Explosions on our Western Rivers.

A correspondent writing to us from Memphis, Tenn., proposes a new plan for the prevention of explosions, which, if carried out, (and certainly there is a great necessity for it) would, in our opinion prevent such calamities. The plan is to have a second safety valve on each boiler, placed entirely out of the reach of the engineer, and to have government inspectors placed at different places, whose business shall be to examine every boat as she comes into the dock,—these men to be selected for capacity and fidelity. These men are to see that the boilers are good and in proper condition and that every one of them has a safety plug of lead in the bottom. Our correspondent is an engineer, has built engines, and is acquainted with western steamboat navigation from its very origin. He has seen many deplorable accidents, the majority of which, he says, have been caused by recklessness. He asserts it is quite common for the western engineers to tie down their safety-valves, and that many of them are quite incapable of performing their duties intelligently, owing to their ignorance of engineering. It is really deplorable, when we think how many of our fellow mortals are murdered every year by the explosion of steam boilers. Our aged correspondent lost a nephew by the explosion of the Louisiana, and he feels deeply on the subject: he was one of the first pilots on the western waters, and was in the prime of life. He asserts that the number of explosions has increased, is increasing, and will increase unless something positive and effectual be done quickly to remove the causes of them. He says by the number of steamboats increasing, competition is keener, this leads to the employment of indifferent engineers, for cheapness (dear in the long run), and consequently a greater number of such heartrending calamities. We would like it if Congress would take hold of this matter with honest zeal for the public good; but we scarcely expect this, we therefore say to the people of the West, "adopt measures in every State, for the prevention of such calamities."

Patent Law Case of an American Invention in Britain.

In the Northern Circuit, Liverpool, April 7, 1851; before Baron Platt and a Special Jury.—Newton vs. Vaucher—The action was for an infringement by J. Ulric Vaucher of a patent granted on the 15th of May, 1843, to the plaintiff, Mr. Newton, of London, on behalf of Isaac Babbett, of Boston, Mass., for improvements in the construction of boxes for the axles of locomotives and carriages, and for the bearings of shafting in general. Before Mr. Babbett's invention the bearings of locomotive axles and of railway carriages were invariably made of gun metal. The castings were bored and fitted for the journals. Owing to the gun metal being so hard, the journals and bearings oftentimes became red hot, and there was a necessity for cooling with cold water, and at all times the amount of oil for lubricating was very great on this account. The bearings did not wear equally, they required to be changed often, and when once worn they were useless. To remedy these evils Mr. Babbett invented his new bearing, which is so well known among us as "Babbett's Anti-Friction Metal Boxes." It consists of a hard shell of brass or gun metal with a lining of soft metal composed mostly of tin. The hard shell is provided with rims for confining the soft metal and for preventing it spreading under pressure. The inside of the shell is first thinly coated with tin; the shell is then placed on an even surface over a mandril the exact size of the journal, and the space between the turned surface of the shell and the mandril is filled in with the white soft metal through a hole bored in the top of the shell. The bearing is then complete for use and requires no more fitting. For this invention Mr. Babbett took out a patent for England, Scotland, and Ireland through Mr. Newton, the nominal plaintiff. Its advantages were admitted; the combination of the hard shell with the soft metal was just what was required, it prevented all abrasion and required but little lubricating material, and when worn out the shell merely requires re-lining and it is as good as ever. A bearing of the locomotive "Hercules," belonging to the Great Western Railway, which had run 80,000 miles was exhibited in the court, and showed no signs of wear on its surface. In 1845 the Grand Junction Railway Company tried to pirate this invention, but in a suit brought by Mr. Newton he obtained damages of £1,000 ($5,000). It is now employed on the most of the English Railroads and on some of the steamships. The defendant tried to trump up an old patent for using soft metal packing in the piston of a pump, for which he obtained a patent in 1838, but the Attorney General, Mr. Knowles, who acted for the plaintiff, destroyed the whole defence in a very short time, by exhibiting the very pump of the defendant with brass bearings only, and the jury decided at once for the plaintiff.

Thunder and Lightning---New Way of Making Gas.

Mr. M. Appleby, in a communication to the East Boston Ledger, says he has discovered a new way of making gas from water, which is thus described:—He uses no helices of copper, brass, or zinc. He fills a proof bottle "with water from the pipe, carburets it in the same bottle, and then by adding (we use his own words) the necessary chemicals, separates the hydrogen from the oxygen. I now attach a tube, made upon the principle of the safety lamp, to the mouth of the bottle. To prevent an explosion, a certain quantity of the gas is allowed to pass over, thus removing what atmospheric air may remain in the bottle. A lighted match now applied to the tube produces a pure, bright and beautiful flame. I have exhibited this light in my shop for the last four months, to the entire satisfaction of a number of intelligent gentlemen who have seen it.

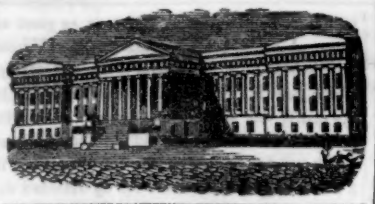
In the course of my experiments with the water gas, an idea struck my mind which seems to me to explain more fully than has ever been done before the phenomena of thunder and lightning. It was not till after several explosions that I succeeded in producing the light. When a number of these had occurred, the idea flashed across my mind, that the explosion of the cloud is caused in the same way through the ignition of the hydrogen it contains by the contact of electricity. Electricity the most powerful chemical agent known, and the only only one which will decompose water, separates the hydrogen from the oxygen, and in combination with atmospheric air, explodes the former, and produces that sublime phenomena which we witness every summer in the clouds above us.

I submit to the scientific world whether the above is not a clear explanation of the phenomena. M. Appleby.

[This is not proof positive of the phenomena of thunder, nor can proof positive be furnished against it. There are gases which explode when ignited, as well as the two mentioned, but the absence of the tremendous quick but huge flame, which should accompany such a phenomena, if explainable on the principle above set forth, is never seen. The loudest thunder is always accompanied with the bluest, and, as it were, the sharpest lightning. There are two theories respecting the cause of that noise we denominate thunder. The one is that the sound proceeds from the closing up of the vacuum in the atmosphere formed by the passage of the electricity through it. The other, and the general received opinion is that thunder is the sound of the vibratory action of the electricity when passing between two clouds or between two points.

Artificial Coal.

In the French Academy of Sciences, some interesting experiments have been made in producing mineral coal by an artificial process, which is expected will throw much light on the subject of geology. Wood is put into an iron or glass cylinder, and closed against any escape of air, and applied to a heat of 660°. The result has been, that the wood was melted and reduced to mineral coal. Old wood of dry fibre produced dry coal; but young wood, or that which was put in wet, produced a glutinous coal.



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LIST OF PATENT CLAIMS
Issued from the United States Patent Office.
FOR THE WEEK ENDING MAY 27, 1851.

To Boliver Newbury, of Catskill, N. Y., for improvement in Lifting Jacks.

I claim the combination in the manner substantially as herein described, of the pawls, the springs, and the spring lever, having projections on each side of its fulcrum, with the lever and the ratchets on the lifting rod, whereby the lifting rod may be forced out from or drawn into the post or standard of the jack, according to the position of the spring lever.

To Henry Brunk, of Albany, N. Y., for improvement in Lap Anvils for Shoemakers.

I claim a metal anvil, shaped substantially as described, that is, with a form adapting it to be held conveniently upon and between the knees and thighs of a workman, having a projection above the mass of metal, conveniently formed into an anvil face, with a small prismatic block near the extremity of one of the arms, as a fulcrum for nippers, when the same are used in stretching or manipulating leather.

To John Robertson, of Brooklyn, N. Y., for improved combination of Dies for Sheet Lead Machines.

I claim the adjustable interior cylindrical and the exterior stationary conical dies, in combination and for the purposes described, irrespective of the precise manner in which they are applied or by which the adjustment is effected.

To G. W. Putnam, of Moreau, N. Y., for improved Vise Jaw for saw filing machinery.

I claim the jaws of the vise shaped to correspond to the shape of the saw teeth, and support the same, so as to prevent vibration during the operation of filing, as herein set forth, whereby a better edge is given to the tooth, the wear of the file is diminished, and the process of sharpening expedited.

To Otis Boyden, of Newark, N. J., for improvement in Alloys of Iron, Zinc, and Nickel.

I claim the making of wrought or malleable iron, either from ordinary iron, or from the ore, by the use or application of metallic zinc or spelter, and by the use of zinc and nickel combined as hereinbefore described.

To Henry Waterman, Williamsburg, N. Y., for improvements in machinery for hardening and straightening saws, &c.

I claim the employment of the apparatus above set forth for straightening and hardening steel plates for saws, &c., at one operation, consisting of the fingers or cams, substantially as described, which support the article to be straightened, compressed, and hardened, combined with and gripped by the drop, in the manner specified.

To Jacob Barnhill, of Circleville, Ohio, for improvement in Seed Planters.

I claim the conical cups attached to segmental rods extending from levers working on a horizontal shaft raised and lowered by the eccentrics and rods, substantially as described —operating in the manner and for the purpose herein set forth.

To E. S. Farson, of Philadelphia, Pa., for improvement in Portable Swings.

I claim the suspension of a swing to the hinged frame, supported or strengthened by the adjustable brace, substantially as herein set forth.

To G. B. Durkee, of Aiden, N. Y., for improvement in Carriages.

I claim making the sides of the bodies or boxes of carriages of a series of springs, slats, or bars, when the same are constructed and operated substantially as herein set forth.

To W. H. Hoyt, of New York, N. Y., for improvement in Omnibus Steps.

I claim the manner of constructing the step as described, viz., by having a portion of the body of the omnibus projecting downwards a suitable distance, the bottom of said projection forming the step, and so arranged as to be perfectly covered and protected by the door when closed, substantially as described.

To James C. Spencer, of Phelps, N. Y., for improvement in Carriages.

I claim the manner of construction as described, viz., forming the body of two separate parts united by a joint which allows the body to vibrate and act upon a single spring, and also admits of a direct attachment of the body to the axles, substantially as set forth.

To Edward Hamilton, of Bridgeport, Conn., (assignor to Nelson Goodyear, of New York, N. Y.), for improvement in excluding dust from railroad cars.

I claim the application of vertical blinds, shutters, or screens on the outside of railroad cars employing the same to prevent the entrance of dust, smoke, cinders, &c., into the windows of the cars, as herein described.

To P. M. Walker, of Marshall, Mo., for improvements in Hemp Brakes.

I claim the combining a sufficient number of slats to break the full length of the hemp at once, in combination with the manner of feeding, substantially as set forth.

To Wm. Biddle, of La Fayette, Ind., for improvement in Self-weighing Machines for Grains.

I do not claim a self-weighing machine operated by the weight of the grain, so as to form an automatic weighing machine, by which, with the aid of a register or index, the amount weighed is ascertained. Nor do I claim opening a gate or door in the bottom of a receiving hopper by the descent of a steelyard, simultaneously with the discharge of the grain from a rotating hopper. But I claim the employment of the metallic plate or its equivalent, attached to the receiving hopper, and made to rise and fall by the action of said hopper and a gauge, in such a manner that on the descent of the suspended hopper, the gauge plate connected therewith, will disengage a catch plate from the right end of the metallic plate, and permit the latter to fall, and cut off the discharge of the grain, and simultaneously therewith open a trap door in the bottom of the suspended hopper, and on the ascent of the same, the receiving hopper will be made to tilt frontward by the weight of the grain so as again to raise the plate and open the hinged door of the said plate simultaneously with the closing of the trap-door, as fully described.

I also claim the employment of the gauge plate when combined with the lower or discharging hopper for the purpose of determining the quantity of grain to be weighed, by limiting the descending movement of the suspended hopper, and consequently gauging the action of the projection on said gauge plate, to cut off the discharge of the grain from the receiving hopper.

I also claim the employment of the vertical pendant rods (two) confined to either side of the frame, when combined with a suspended hopper provided with a trap door, for the purpose of opening and closing said trap door by their descent, alternately, said vertical pendant rods being respectively actuated by the descent of the metallic plate, to disengage the spring catch from the rod, to open the trap door, and by the tilting frontward of the receiving hopper, to disengage the spring bar from the vertical rod, and allow its descent to close the trap door, as set forth.

To Wm. A. McFarland, and T. C. Carpenter, of Wilmington, Del., for improvement in Bran Dusters.

We claim the combination of the scouring, beating, and distributing brush, with the perforated guard plate surrounding it, whereby the bran to be dressed is more equably distributed and fed to the bolt than has been done by devices heretofore in use for the purpose.

To Nelson Barlow, of St. Louis, Mo., for improvement in Planing Machines.

I claim, first, the jointing or hinging of the plane stock supporting frame, or its equivalent, at one end and giving it an elastic bearing at its opposite end, substantially as herein set forth, whether the said plane stock supporting frame be used in connection with individually vibrating plane stocks, or with other descriptions of plane stocks or planing knives, or cutters, for the purpose of reducing or planing planks or boards upon their sides or edges.

Second, I claim the combination of the supporting frame containing the adjustable plane stocks, H H, with the self-adjusting supporting frame containing the plane stocks, by which the inner or under surfaces of the plane stocks are made to form a self-adjusting bed on one side of a plank, whilst the knives in the stocks are operating upon and facing the opposite side of the same; and by which the inner or under surfaces of the plane stocks are made to form an unyielding bed on one side of a plank, whilst the knives in the plane stocks are operating upon and reducing its opposite side, and by which a plank can be faced on one side, and reduced and faced upon its opposite side, at simultaneous operations, substantially as herein set forth.

Third, I claim the combination of the supporting frame containing the self-adjusting plane stocks, with the arbor of the roller at its forward end, and with the supporting frame containing the plane stocks at its rear end, for the purpose, in the first place, of so guiding the transversely reciprocating movements of the said plane stock supporting frames, as to keep the inner sides of the respective series of plane stocks contained therein parallel with each other, and parallel with the surfaces of the two pairs of rollers; and, in the second place, for the purpose of enabling the supporting frame containing the self-adjusting plane stocks to be detached from the supporting frame containing the adjustable plane stock, and be swung outwards upon the shaft of the roller, to afford free access to the inner sides of the plane stocks in both the said plane stock supporting frames, substantially as herein set forth.

Fourth, I claim the combination of the rollers with the plane stocks, when they are so arranged that the roller in one plane stock will form a rotating and self-adjusting mouthpiece to the planing knife that succeeds it, and at the same time form a bed on one side of a plank for a planing knife acting upon its opposite, substantially as set forth.

Fifth, I claim the giving to straight edged planing or reducing knives or cutters that are arranged athwart the surfaces of the boards or planks operated upon, a transversely reciprocating movement, whilst a continuous longitudinal movement is imparted to the said boards or planks.

Sixth, I claim the manner of producing a uniform elastic pressure upon the upper and lower bearing boxes of the arbors of the pressure rollers, viz., by means of pairs of screws arranged as herein described, and having threads inclining at angles of about 30° with their axes, which are banded together and operated upon by a weight, substantially as herein set forth.

Seventh, I claim the improved stock that receives the tonguing cutters, composed of the central governing plate, combined with the projections on the two side plates, substantially as set forth.

Eighth, I also claim the manner of combining the stationary cutters, with the governing centre plate, by means of the inclined projections on the sides of the said plate, the flaring notches in the plate, and the gibs having lugs at each extremity, placed in the said flaring notches and acting upon the edges and front sides of the said cutters, substantially as set forth.

To Edward Maynard, of Washington, D. C., for improvement in Breech-loading Fire-arms.

I claim, in that class of breech-loading fire-arms in which the barrel is disconnected from the breech and is pivotted at some point intermediate between its butt and its muzzle to the stock, a lever beneath the stock by means of which the barrel, is turned upon its pivot to raise and to depress its butt, and is locked to its breech when the butt is depressed and is unlocked therefrom to allow the butt to be raised, the several members of the implement being arranged and operating substantially as herein set forth.

In combination with the above claimed device, I claim a piston breech-pin, which, by the movement of the lever to depress the butt of the barrel, and to lock it in place, is made to move the cartridge forward in the barrel and to close the butt thereof, and which, by the movement of the lever to unlock and raise the barrel, is made to unclose or open the butt of the barrel before the latter rises under the action of the lever.

I also claim the sliding bolt, constructed with slot and hook, or their equivalents, and arranged as herein set forth, in combination with a lever handle, for the purpose of imparting motion to the piston breech-pin from the lever beneath.

To N. Dawes & H. Harrison, of Little York, N. J., for improvement in Boot Crimps. Ante-dated Jan. 31, 1851.

We claim the combination of the spring frame, crimping plates, and boot tree, with two adjustable side springs, for the purpose of crimping boot fronts and adjusting the pressure of the crimping plates to the particular point in which the creases have a tendency to run, the whole being arranged in the manner described, or in any manner essentially the same.

DESIGNS.

To Wm. L. Hathaway, of Dighton, Mass., for design for Stoves.

To N. P. Richardson, of Portland, Me., for Design for Stoves.

To Ezra Ripley, of Troy, N. Y., (assignor to Stafford & Co.), for design for Stoves.

(For the Scientific American.)

Practical Remarks on Illuminating Gas.

[Continued from page 294.]

Here, then, the greater quantity of gas is accounted for, at one time by *working up the residuum*, another by the *additional percentage of water gas*. Hence from 1 cwt. of rosin, any quantity of gas may be got, provided an additional supply of water gas be introduced. But, then, as Mr. White properly admits, this acts injuriously on the illuminating power, consequently the less there is of the water gas the better, in so far as light giving is concerned. Here again we have additional proof of what I have already advanced, derived from Mr. White's statement. He has said that in his process the water costs *nil*. I go still farther and maintain that the water *is nil*, not only before it goes into the retort, but also (if this word will admit of a comparative degree) that it is worse than *nil* after it escapes from it. Why, then use it? Merely, I presume, because it adds to the quantity, and with some quantity goes a great way.

PAINE'S ELECTRIC LIGHT.—We will take advantage, before leaving the subject of gases, of the opportunity here afforded to make a few remarks upon the "electric light" which has caused so much controversy during the past few years, in the newspapers and also in many of the journals of the day. The new light which was at one time supposed to have been invented, and was to supersede all other systems of illumination, its cost being a mere nothing, was termed "Paine's Hydro-Electric Light;" so called in honor of the illustrious projector. The theory advanced by its maker, and the said method of producing it, was by the decomposition of water by electricity, and by this means to resolve this matter into its original elements, namely oxygen and hydrogen; the latter of which was collected, and after being carbonized (or as he has since termed it, catalyzed) by passing through a material rich in carbon, was said to be in readiness for illumination. The substance used for carbonizing the hydrogen is stated to be spirits of turpentine. Let us for a moment look at the principles of this operation, in order that we may thoroughly understand the nature of the subject before us. Water is a compound element, composed of oxygen and hydrogen; according to Henry its analysis is as follows:—85 per cent. of oxygen, 15 per cent of hydrogen—by weight; 2 parts of hydrogen, 1 part of oxygen—by volume. J.B B.

(To be Continued.)

Population of France.

The census recently taken in France shows a total population of 35,500,000. The number of foreigners domiciled, of all nations, exceeds 1,000,000; of these upwards of 75,000 are English, in various parts of the country, which is considerably less than previous to the revolution, when it exceeded 150,000.

TO CORRESPONDENTS.

E. B., of N. Y.—Your model has been received and carefully examined, but in case you make an application for a patent it will be necessary that you attach to your improvement some kind of a drill, in order to represent its adaptation and operation. We should judge the improvement which you have made an important one, and we think a patent would be granted upon it if proper claims were made.

C. & E. H., of Mass.—There is no particular part of your machine on which claims could be based, but a claim on the combination of the several parts for the purposes specified would probably be admitted. It is not for us to state whether a patent would be profitable to you or not; that would depend upon the manner in which you managed the matter after the patent was issued.

L. B. G., of Pa.—In Vol. 4 of the Scientific American, you will find a description of a machine for drilling boiler iron, which so nearly resembles the drawing you sent us, that at first we mistook it for precisely the same device. There is nothing patentable in your invention that we perceive.

G. J. W., of Me.—The expense of getting up engravings of your Loom, and publishing in the Sci. Am., would be $10. The friction rollers adapted to the parts you describe would not be patentable.

D. J. C., of Phila.—We should think Col. Storm's patent embraced all the novelty that your invention seems to possess, and moreover, that his claim includes much that could not be sustained if brought before a jury for trial. In regard to forming a stock company to introduce your invention, we think it would be fallacious, unless you first secure a patent, but we do not profess to advise in financial matters, and therefore recommend you to consult some of our Wall street citizens, who attend to nothing else.

H. A. L , of N. Y.—The condenser for the purpose you state has been often tried, and some of our steamships now use them. It is not new. We have several patent condensers, such as Hall's and Pierson's.

B. W. W., of Tenn.—We do not know of a single good work such as you describe. We are very much obliged to you for your kindness.

A. M., of N. Y.—Your article on the pendulum came to hand too late for insertion this week.

J. L. E , of Mass.—We knew of no such "Steam Gauge" as the one you describe. The mercury gauge is the one in common use. The plan of operating the dial by the rise and fall of the float, is employed in water reservoirs : nothing could be claimed on that. The claim would have to be on the general arrangement.

W. B., of N. Y.—Your mode of constructing saw teeth would not interfere with Mr. Tuttle's claim in the least, moreover, there is nothing patentable in it. The mere form of constructing the teeth of saws is in no case patentable.

R. McC., of Pittsburg, Pa.—The model of your fence, and the letter containing money, were both duly received. An engraving would cost you $8.

A. M. G., of Farm Forest.—By the Southerner we received your model of the Cotton Press, which we have had thoroughly examined, but which, we are sorry to state, presents nothing of a patentable character. Your mode of raising and depressing the follower, when pressing, by means of the rack and pinion, are very common devices; so also are friction rollers for producing the same result. We could not recommend you to make an application for a patent.

B. H. W., of Macon, Ga.—The specification of Mr. Stone was sent to your post office, addressed to Mr. S., on the 26th of last March, therefore you perceive there has been no delay on our part. Instruct Mr. Stone to call at the post office and we think he will there find his papers all ready for execution, with a bill inside.

A. K., of N. Y.—The specifications and drawings are perfectly completed on both your applications.

W. E. T., of Mass.—The Churn sent for our examination, does not seem to possess any feature of a patentable character. Churns with stationary projections on the sides of the inner band, and revolving arms attached to the shaft, are a common device.

J. S., of N. Y.—An application was once made for a patent on the device you describe, and rejected on the grounds of the same article being illustrated in Reese's Encyclopedia. A patent could not be obtained for you.

D. R. McK., of Boston.—The drawing which your Nova Scotia friend sent us is too imperfect to be understood.

W. L., of Galt, C. W.—We have made an application for a patent on a machine for turning irregular forms, the rollers for producing the eccentric being constructed precisely like your model.

D. R., of Phila.—Doctor Gilbert resides at New Orleans yet, and will not probably remove to New York the present season. If we were afflicted with a cancerous humor, we should certainly spare no trouble or expense within our limits to consult him concerning it. Dr. Gilbert's testimonials are a sufficient guarantee of his unbounded skill in the treatment of cancers.

J. E. M., of Ala.—Yours has just come to hand.

C. B., of N. Y.—The only terms on which we sell Alcott's Turning Lathes is for cash in advance : price $25.

A. L., of Ga.—By addressing a letter to J. G. Winter, at Columbus, Ga., you will learn all the particulars concerning Rich's Wheel, which we believe to be a very good one, and perhaps you might enter into a contract with him to manufacture and sell.

C. S. F., of N. Y.—Tannin has often been used to prevent incrustations in boilers, therefore no patent could be secured upon its application to boilers for that purpose.

S. K., of La.—Your letter of May 20th, with enclosure, came safely. Those back numbers have been forwarded and your subscription extended to Vol. 8, No. 52.

S. S. B., of O.—We believe your invention to be patentable, but we should doubt its being profitable if a patent were obtained.

F. W. S., of N. Y.—We have no interest in Mr. Bruce's offer, and stated, in a subsequent number to the one you speak of, that we could not give any more information upon the subject. If you would open a communication with him you would arrive at the information you desire at once. It is not for us to request of him any alteration of his terms.

Z. P., of Pa.—We have received yours and will notice it.

C. H. J., of ——.—We have received such a pile of communications on the same subject that we are afraid it will not be prudent to publish any of them.

S. M. Y., of Ky.—Your drawings of a stove have been examined, and we can state that nothing of the arrangement you present has ever been represented to us before. Such an innumerable variety of stoves have been patented that we could not express an opinion as to the patentability of yours, further than is stated above. A patent, if secured on the arrangement of the pipes, would also cover the same device in a range or other heating apparatus. Your mode of producing warmth to hot house beds is well known.

R. S. K., of Ala.—In Vol. 2, Sci. Am., pages 292 and 300, describe boiler feeders like yours in principle —the arrangement only is a little different. We do not believe you could get a patent. A good set of instruments would cost $25.

Money received on account of Patent Office business since May 27 :

J. A. J., of Ct., $20; O. S., of N. Y., $30; M. M. I., of Ga., $25; E. G. B., of Me., $35; B. J. B., of N. Y., $40; R. M. F., of N. Y., $15; S. A., of Pa., $25; T. L., of N. Y., $50; R. D., of L. I., $35; G. L. H., of Ct., $15.

Specifications and drawings of inventions belonging to parties with the following initials, have been forwarded to the Patent Office since May 27 :

J. S. R., of Ct.; of B. J. B., of N. Y.; S. A., of Pa.; R. D., of L. I.; M. M. J., of Ga.

Back Numbers and Volumes.

In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement :

Of Volumes 1, 2, and 3—none.

Of Volume 4, about 20 Nos., price 50 cts.

Of Volume 5, all, price, in sheets, $2; bound, $2,75.

Of Volume 6, all back Nos., at subscription price.

New Edition of the Patent Laws.

We have just issued another edition of the American Patent Laws, which was delayed until after the adjournment of the last Congress, on account of an expected modification in them. The pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office We shall continue to furnish them for 12 1-2 cts. per copy.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and enclosing one dollar as fee for copying.

Scientific Museum.

Dr. Farnday on Chimneys.

At the Royal Institution, in a series of lectures on chemistry applied to domestic purposes, Dr. Farnday has thus philosophized on "a chimney." Various illustrations were given to show the importance of the functions of the chimney. A parlour fire will consume in twelve hours 40 lbs. of coal, the combustion rendering 42,000 gallons of air unfit to support life. Not only is that large amount of deleterious product carried away and rendered innoxious by the chimney, but five times that quantity of air is also carried up by the draught, and ventilation thus effectually maintained. The force of a draught was illustrated by a descending flue. A colored flame was held near the end of a tube bent like an inverted syphon. As soon as the tube was heated, the ascent of the air within the longer arm of the tube drew the flame downwards into the shorter arm with considerable force. Since the ascent of smoke up the chimney depends on the comparative lightness of the column of air within to that of an equal column without, the longer the chimney the stronger will be the draught, if the fire be sufficiently great to heat air; but if the chimney be so long that the air is cooled as it approaches the top, the draught is diminished. A case of this kind occurred at a lighthouse on the Isle of Portland. The chimney which ventilated the building and the lantern was carried on the outside, and in the winter time the draught was so much impaired that the windows became dim and the lights obscure. An attempt had previously been made to remedy the defect by lengthening the chimney; but that, of course, had made it smoke all the more. The application of a jet of steam to increase the blast of locomotive engine furnaces was illustrated. The lower end of a bent glass tube was placed in a dish which contained colored liquid, the upper end being inverted into a larger and horizontal tube. A jet of high-pressure steam directed through the larger tube caused such a rush of air to supply the place of the air expelled by the steam, that the colored liquid rose to the top of the tube. The mechanical force of a jet of high-pressure steam was shown by causing it to sustain an egg, which was seen dancing about in the air without anything apparent to support it.

The Science of Going to Bed.

The earth is a magnet, with magnetic currents constantly playing around it. The human body is also a magnet, and when the body is placed in certain relations to earth these currents harmonize—when in any other position they conflict. When one position is to be maintained for some time, a position should be chosen in which the magnetic currents of the earth and the body will not conflict. This position, as indicated by theory, and known by experiment, is to lie with the head towards the north pole. Persons who sleep with their heads in the opposite direction, or cross-wise are liable to fall into various nervous disorders. When they go back to the right position, these disorders, if not too deeply impressed upon the constitution, soon vanish. Sensitive persons are always more refreshed by sleep when their heads point due north. Architects in planning houses should bear this principle in mind.—Ex.

[The above is not true in any particular, at least in our case, for sleeping transversely to the north and south polar line, for 20 years, has not cost one dollar for doctors' bills, a blessing for which we are grateful to the Great Physician, not the north pole.

The Salt Lake.

Lieut. Gunnison, of the Topographical Engineers, who has been employed for a long time past in the survey of the Great Basin in which the Salt Lake is situated, speaks of the lake as an object of great curiosity. The water is about one-third salt, yielding that amount on boiling. Its condensity is considerably greater than that of the Dead Sea. One can hardly get his whole body below the surface. In a sitting position the head and shoulders will remain above water, such is the strength of the brine, and on coming to the shore the body is covered over with an incrustation of salt, in fine crystals. The most surprising thing about it is the fact that during the summer season the lake throws on shore abundance of salt, while in the winter season it throws up glauber salt in great quantities.

For the Scientific American.

Hydraulics.

(Continued from page 296.)

Power of Water and Wheels.—A water wheel has no power in itself, the power is the water, and the value of this power is its quantity multiplied into its velocity; a small wheel and a large one are equally powerful when standing still, and the amount of that power is equal to 0. A small and a large quantity of water are of equal hydrodynamic power when motion is left out of the question, and that power is 0. Velocity, then, is the great first element, then quantity. Place two cannon balls together on a table, the one 50 lbs. the other 1 lb.: they are both inert—they have no power in themselves, and they stand in reference to mechanical effect as equals, measured by 0. To make them produce an effect they must receive an impulse in some direction: six ounces of powder, for example. Well, as both have recived the same impulsive force, there will be no difference in the effect each will produce. The one being fifty times less than the other will have fifty times the velocity; but the other being fifty times heavier will have fifty times the quantity less the velocity, and these two are equal in momentum. It is just so with water-wheels, the only difference being in the nature of the impulsive element; the powder acts by expansive, the water by gravitating force.

The water wheel may also be compared to a steam engine, more especially the Turbine wheels, which work in air-tight cases. The way to calculate the power of a steam engine is to multiply the pressure of the steam in square inches into the velocity of the piston; the essential elements of this power, however, are embraced in the pressure and the number of square inches in the area of the piston. The area of the piston measures the quantity, the pressure the velocity, and these two multiplied together give the power—the momentum. The peculiar feature in measuring the power of of water, lies in "the law of falling bodies," —gravitation. Water descending over a fall of 32 feet will have, at the bottom of the fall, four times the velocity of water falling only 16 feet, for, according to the law of falling bodies, the velocity is according to the square of the times. It is well known that bodies fall through a space of 16 1-12 feet in one second, therefore, in two seconds, they fall 64 feet. At the end of the first second, at the bottom of the 16 feet fall, the water has attained to the velocity of 32 feet.

In order to determine the space which a body, falling freely by the action of gravity, would describe, in a given time, multiply the square of the time in seconds, by 16 1-12 or say 16, the product will be the space fallen through by the body in feet. To determine the velocity of any jet or body of water falling from any given height, multiply the square root of the height in feet, by 8 1-24, or, for simplicity, say 8; the product will be the velocity of the water in feet per second. All that has to be done now is to take the quantity of water, and multiply it into this velocity, and we have its power. For example, we have stated that water has a velocity of 32 feet at the bottom of a fall of 16 feet; well, the square root of 16 is 4, which, if multiplied by 8, gives 32—and so it is with all falls of whatever height.

The power we have, then, to produce mechanical effect, is as the quantity and fall of the perpendicular height. What is the mechanical power of 20 cubic feet of water, fall 16 feet? Each cubic foot of water weighs 62½ lbs.: $\sqrt{16}\times8=32\times20\times62\frac{1}{2}\times60\div33{,}000=72$ 24-33 horse-power is the answer, any one would say at the first, but it is not so. Horse-power means the elevation of a certain weight, 33,000 lbs., one foot high per minute, consequently the space through which the water falls downward, and the space through which (as measured by horse-power) it is lifted upward, must be placed on a parallel basis, and the simple way to do this is to multiply the weight of the water by the space through which it falls in a given time. Thus 20 cubic feet$\times62\frac{1}{2}$ weighs 1,250 lbs., this falls through 16 feet of space in a second, $1{,}250\times16=25{,}000$ which multiplied by 60, the number of seconds in a minute, gives 1,200,000, which if divided by 33,000 lbs., the weight lifted one foot high in one minute (a horse-power) gives 36 2-33 horse-power; this is the theoretical horse-power, one third of which is deducted, as the power of an overshot wheel is as 2 to 3. Two-thirds of 36 13-33, then, is 24 24-100 horse-power to within a very small fraction. This calculation agrees with the table, which only gives the result, (not the mode of doing it as we have done) in Leonard's Mechanical Principia, page 15.

How is the quantity or cubic feet of water to be measured? Not as some suppose by merely looking at it. It would be just as easy to tell the number of cobble stones in a heap as to tell the number of cubic feet of water in a stream without adopting means to measure it. The table last week gives some information on the subject, but let us suppose the fall to be 16 feet, and the volume of water in the stream to be measured by passing through an opening in a board of 24 by 12 inches, then we have $24\times12=288$, the area, which, if multiplied by 192, the number of inches in 16 feet, gives 55,296 cubic inches, which if divided by 1,728 gives 32 cubic feet falling through 16 feet of space in 1 second. The whole fall must be considered a trunk of water with an area of 288 square inches and a depth of 192 square inches, its velocity is due to that of falling bodies, the law of gravity, without which there would be no more power in a 100 foot than a 2 foot fall. It is impossible to go over the whole ground minutely, when whole volumes have been written on the subject, but it is hoped that what has been said has been presented in a clear light. See Weisback's Mechanics, Edinburgh Encyclopedia, Smeaton &c.

We have yet to present a few water wheels, also an illustration of the nature, construction, and operation of the Hydraulic Ram.

The United States at the Exhibition.

The United States make a very imposing outside show, with a space second only to France in extent, but unfortunately the performance does not come up to the promise. The space was by no means too large if each State had sent a contribution of its principal valuables, or if the great Republic had lain as close to us as Ireland, so that shortcomings might have been easily amended to the last moment. We have, however, no right to reproach Brother Jonathan, for we must not forget that the United States had not only the disadvantage of the greatest distance to traverse, but an utter want of those Government arrangements which have enabled Austria especially, France and its neighbors, and even Tunis and Egypt, to make a respectable show. They were distracted also by conflicting rumors as to the success and extent of the exhibition. Besides the chief produce of the States, fit for exhibition, consists of raw produce, which it is no one's interest to send.

There are very few of their manufactures which they could hope to sell here. American manufactures of the same kind as those exported from Europe could only be sent as a matter of curiosity by a Government organization. Private individuals seldom take such useless trouble.

In the British department, the mineral exhibitions, and some of the manufacturing machinery, have been sent up by a local subscription. Of course, this could not be carried out to any extent in those newly-settled western states about which we feel most curious.

Still there can be no doubt, that if the "States-men" had had any idea of the kind of Palace prepared to receive, and the number of gazers prepared to examine their contributions, they would have exerted themselves to make a much greater show.—[London Illustrated News.

[These remarks of the last received "Illustrated News" are most candid and fair. We could have made a much better show if the right measures had been adopted for that purpose. We do not, like some of our papers, try to find an excuse by saying, "America is a great producing country—her products are chiefly those of the soil, and it cannot be expected that she can appear and compete well with older nations." It is true that her products are chiefly agricultural, but, at the same time, any person has but to visit our factories, machine shops, &c., to be cured of any skepticism respecting the high standard of American mechanical and artistical art. We have been informed that articles will be received from America till August. Thomas Prosser, C. E., 28 Platt street, this city, will sail for London about the 25th June, and will take charge, the expenses being paid for the same —of any article for the Exhibition. Those who would yet like to send articles to the Great Exhibition have now an opportunity afforded them for so doing.

Our Paper.

The great number of illustrations and the large amount of useful matter in this Volume of the Scientific American, make it the cheapest and best work of the present age, on Science, Art, and Inventions.

LITERARY NOTICES.

The New York Book of Facts, 1851.—This is a re-publication of the famous and time-honored London work of John Timbs, by A. Hart, late Carey & Hart, Philadelphia. It is neatly printed and is really a handsome volume in appearance, but it is chiefly valuable for the great amount of useful information it contains. It is made up of extracts descriptive of discoveries in every department of science and art, during 1850. It is a record of improvements and may be considered a standard work. The article on Chimneys, by Dr. Faraday, in another column, is selected from it.

Dictionary of Mechanics and Engine Work.—No. 30 of this able work, published by D. Appleton & Co., New York, contains articles on "Paper Machines," "Parallel Motions," "Pendulum," "Pile Drivers," "Planing Machines," "Pin Making," and "Dick's Anti-friction Press." The illustrations on Pin Making, by the severest study, we have not been able to unravel. We regret the absence of the old Woodworth Planing Machine. As a Dictionary of Mechanics, it is incomplete and worthless in this department, without that machine. The praise bestowed upon Dick's Press is not out of place—it is worthy of it.